

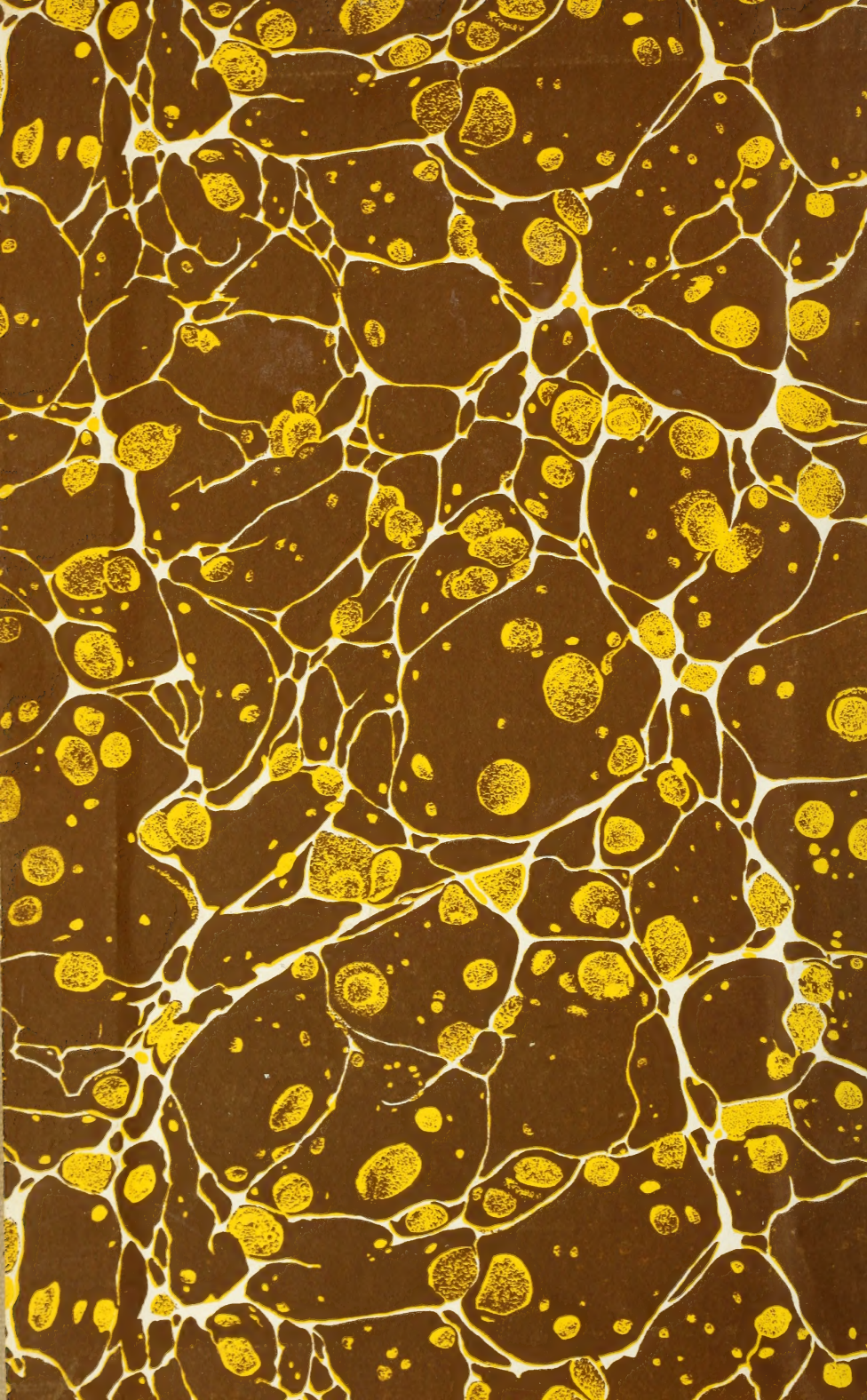




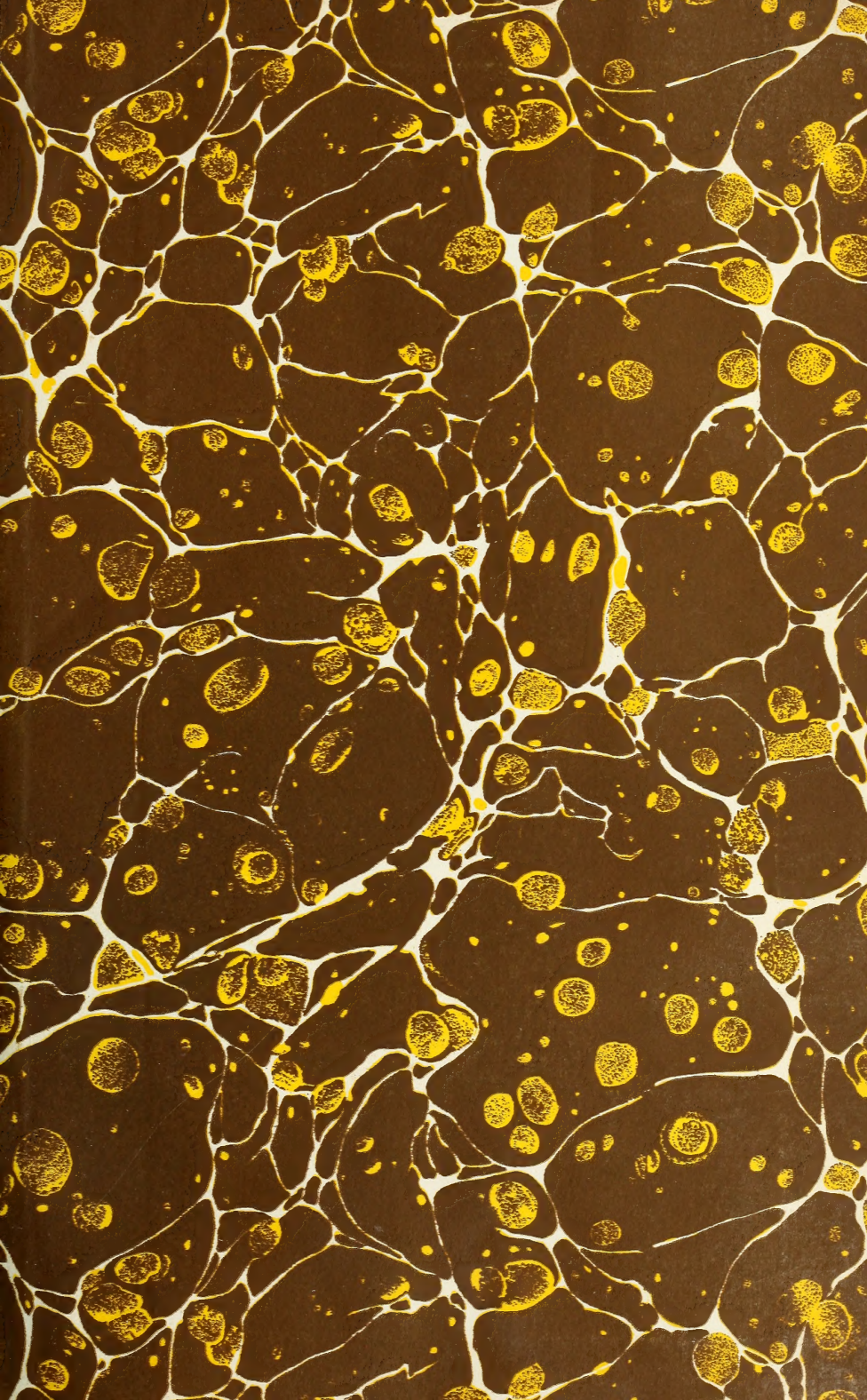
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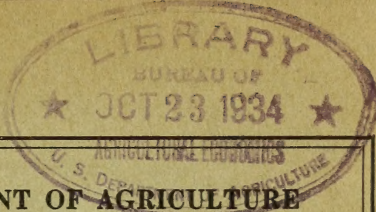
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UNITED STATES DEPARTMENT OF AGRICULTURE

Miscellaneous Publication No. 198

WASHINGTON, D.C.

ISSUED SEPTEMBER 1934

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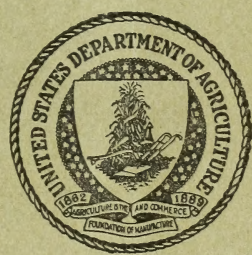
BY

J. S. WADE

Associate Entomologist

Division of Cereal and Forage Insects

Bureau of Entomology and Plant Quarantine









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AN ANNOTATED BIBLIOGRAPHY OF THE HESSIAN  
FLY, *PHYTOPHAGA DESTRUCTOR* (SAY)

By J. S. WADE, *associate entomologist, Division of Cereal and Forage Insects,  
Bureau of Entomology and Plant Quarantine*

INTRODUCTION

It is the purpose of this publication to present in a form as condensed as is feasible an annotated bibliography of the hessian fly, *Phytophaga destructor* (Say), with special reference to the literature relating to the insect within its areas of distribution in North America north of Mexico, to June 30, 1933.

The outstanding importance of this insect as a crop pest and the almost incalculable damage it has wrought to American farmers since it gained entry into the United States indicate that it will continue to be a subject of great interest and study, and the value of a bibliography to future investigators is obvious.

This bibliography presents results of some 18 years of collection by the compiler in a number of the larger public libraries in the eastern part of the United States. The assembling and much of the work, however, has been done at Washington where, through the facilities of departmental and other libraries, such studies can be prosecuted with a fullness and completeness not elsewhere possible. In this connection it is a pleasure to acknowledge the many favors extended by officials of all the institutions concerned, as well as by many of the compiler's colleagues, and others who from time to time have aided in making the work more complete.

Since H. A. Hagen, C. V. Riley, and others have discussed quite fully in the references cited herein the probable manner of introduction and the early appearance of the fly in North America, only brief mention is made here of some of the more noteworthy records pertaining to its early history. Considerable confusion regarding the identity of the fly apparently existed during the early decades of the period covered, and this has intensified the difficulty in the selection of references. Some of the earliest of these records, irrespective of correct identity of the pest, were anonymous or obscure contributions to periodicals between 1785 and 1825, notably *Pennsylvania Mercury* and *Universal Advertiser*; *Annals of Agriculture*; *American Monthly Magazine and Critical Review*; and *American Farmer*. During this period there were also a few contributions to transactions of learned societies, such as *Matthew Carey's American Museum*; *American Philosophical Society Transactions*; *New York Society for Promotion*

of Agriculture, Arts, and Manufactures; Massachusetts Society for Promotion of Agriculture; and Memoirs of the Philadelphia Agricultural Society. Probably the writers whose observations were most dependable during those years were G. Morgan (1787), P. Muhlenberg (1788), L. Carter (1789), A. Young (1789), Thomas Jefferson (1792), William Kirby (1798, 1800), J. Cooper (1799), C. A. LeSueur (1817), Thomas Say (1817, 1818), J. H. Cocke (1819), Edward Tilghman (1820, 1825), and Kirby and Spence (1822). In the decades subsequent to 1825 the references became sufficiently numerous and varied to render specific mention impracticable, except for certain outstanding articles, as those by E. C. Herrick (1841), Asa Fitch (1846), Kirby and Spence (1846), A. S. Packard (1878, 1880), and S. A. Forbes (1887-90). Other writers who at various dates made noteworthy additions to the history of the investigation included such individuals as C. V. Riley, Cyrus Thomas, F. M. Webster, Lawrence Bruner, C. J. S. Bethune, and Albert Koebele.

Obviously, only a part of the foreign literature could be included, not only because of the mere limitations of space and bulk but also because a complete examination of European literature could best be made by a bibliographer having access to the principal libraries of the Old World, and by one more familiar than the compiler with the various languages in which the facts are recorded. It is equally obvious that not all of the foreign literature could be omitted without seriously detracting from the purpose of the present compilation and lessening its value, particularly in the studies of the distribution of the pest and its strictly historical aspect. Only those foreign references, therefore, which are of particular usefulness to workers in this country have been included.

The scope of this publication does not permit the inclusion of references to literature dealing with the synonymy of hessian-fly parasites, except insofar as such references also contain data on other phases of the hessian-fly investigation, since full treatment of the literature on synonymy of parasites is given by Gahan (429).

Of necessity, a number of articles have been listed which repeat facts already stated. This has been necessary because of other information in the articles, as notices of local outbreaks and data as to the presence of parasites, the spread of the pest in given years, or special control demonstrations. In a number of instances, but not always, inclusive pagination is given instead of the first page or that on which the particular reference appears. This procedure has been deemed most useful for quick reference because of variation in pagination in the different publications in which some of the writings, notably certain State experiment station reports, were issued.

It has not been considered feasible to include the numerous valuable references on the hessian fly contained in the Insect Pest Survey Bulletin, a monthly review of entomological conditions throughout the United States, prepared by the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture with the cooperation of State entomological agencies, as this work is issued only in mimeographed form and is of a character so ephemeral that it probably would not be permanently preserved by a large number of libraries widely distributed throughout the country. However, in order to insure completeness of data, investigators studying the progress of hessian fly investigations in the United States since May 1, 1921, should review the Insect Pest Survey reports.



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Brief popular discussion.

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- WORTH, J.—Continued. (1249)  
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- 
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- X (1252)  
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Brief discussion of resistant varieties of wheat; bearded wheat recommended because it is harder and stronger.
- YARNELL, R. (1253)  
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Description of fly section in insect control booth at Kansas State Fair at Topeka in 1920.
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- BOYS JOIN ANTI-BUG BRIGADE. Kans. Farmer 60 (11): 6. 1922. (1254)  
Brief popular discussion of teaching insect control, including control of fly.
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- YOUNG, A. (1256)  
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Gives communications from American Consul at Philadelphia, the President of the Royal Society, and others on the possibility of importing fly in cargoes of wheat, together with minutes of privy council and reports touching on the question.

# CHRONOLOGICAL INDEX

|      | Citation no.  |
|------|---|
| 1759 | 297, 490  |
| 1764 | 298   |
| 1785 | 1252  |
| 1787 | 1, 167, 194, 781, 782, 1116   |
| 1788 | 2, 3, 4, 783, 794, 920, 1107, 1108, 1145, 1251  |
| 1789 | 123, 181, 1256  |
| 1792 | 530, 614, 1111, 1145  |
| 1797 | 760, 1102   |
| 1798 | 640   |
| 1799 | 216   |
| 1800 | 641   |
| 1801 | 531, 775  |
| 1804 | 776   |
| 1817 | 111, 116, 677, 773, 1006  |
| 1818 | 117, 774, 1005, 1007  |
| 1819 | 5, 6, 125, 205, 694, 765, 814   |
| 1820 | 7, 8, 9, 10, 1242   |
| 1821 | 1243, 1244  |
| 1822 | 12, 13, 482, 643  |
| 1823 | 14, 15, 16, 17, 18, 132, 206, 559, 799, 985, 1100, 1245, 1246, 1247   |
| 1824 | 19, 145, 570, 929, 1010, 1233   |
| 1825 | 20, 21, 22, 23, 24, 25, 207, 499, 576, 1088   |
| 1826 | 26, 27, 28, 29, 30, 161, 188, 603, 711  |
| 1827 | 31, 448, 855, 1237  |
| 1829 | 422, 452, 453, 642, 900, 1019   |
| 1830 | 32, 33, 494   |
| 1831 | 34, 35, 36, 37, 801, 856  |
| 1832 | 38, 39, 800   |
| 1836 | 896, 897  |
| 1837 | 40, 41, 42, 43, 1248, 1249  |
| 1839 | 454   |
| 1840 | 44, 45, 46, 196, 423  |
| 1841 | 47, 48, 49, 137, 198, 199, 201, 240, 302, 424, 478, 484, 495, 550, 651, 785, 826, 898, 1086, 1101, 1221, 1250 |
| 1842 | 50, 169, 496, 497, 854  |
| 1843 | 197, 200, 202, 203, 204, 440, 786   |
| 1844 | 551, 970  |
| 1845 | 241, 351  |
| 1846 | 51, 52, 352, 353, 354, 669  |
| 1847 | 352, 354, 670, 671, 787, 788, 789, 1110   |
| 1848 | 53  |
| 1849 | 672, 790, 914   |
| 1851 | 277, 314, 355, 441, 759, 791, 792   |
| 1853 | 619   |
| 1854 | 54, 144, 491, 567, 655, 921   |
| 1855 | 447, 647, 989   |
| 1856 | 356, 597, 1020, 1144  |
| 1857 | 569   |
| 1858 | 419, 568, 618   |
| 1859 | 357, 568, 1126  |
| 1860 | 242, 358, 648   |
| 1861 | 360, 498, 1117, 1127  |
| 1862 | 359, 360, 577, 833, 1127  |
| 1863 | 361   |
| 1864 | 1127, 1128  |
| 1865 | 1127, 1129  |
| 1866 | 283, 362, 1130, 1131, 1132, 1133, 1134  |
| 1867 | 147, 283, 860, 1135   |
| 1868 | 1136, 1137  |
| 1869 | 55, 552, 796, 858, 859, 1138, 1139  |
| 1870 | 858   |
| 1871 | 795   |
| 1872 | 139, 653, 679, 858  |
| 1873 | 140, 860  |
| 1874 | 858   |
| 1876 | 812, 858  |
| 1877 | 141, 861, 862, 863  |
| 1878 | 211, 280, 680, 681, 805, 855, 1092  |
| 1879 | 476, 831, 864, 865, 1001, 1002  |
| 1880 | 481, 485, 486   |
| 1881 | 492, 682, 710, 858, 866, 868, 930, 931, 1002, 1076  |
| 1882 | 867, 928, 932, 933, 1078  |
| 1883 | 217, 683, 684, 685, 1002, 1003, 1077  |

|      | Citation no  |
|------|--|
| 1883 | 130, 396, 867, 934, 935, 1002, 1003, 1117  |
| 1884 | 396, 397, 487, 583, 1002   |
| 1885 | 56, 281, 365, 396, 398, 399, 488, 489, 686, 687, 1043, 1044, 1155, 1216, 1217  |
| 1886 | 400, 401, 688, 833, 936, 937, 1224   |
| 1887 | 57, 129, 306, 363, 366, 367, 612, 689, 763, 834, 835, 836, 837, 838, 938, 939, 940, 1045, 1218, 1222, 1225, 1226   |
| 1888 | 307, 308, 402, 584, 690, 737, 839, 840, 844, 941, 942, 943, 944, 945, 946, 947   |
| 1889 | 368, 403, 404, 649, 691, 841, 948, 949, 1227   |
| 1890 | 369, 370, 405, 406, 407, 650, 842, 950, 951, 952, 953, 1049, 1156  |
| 1891 | 142, 309, 371, 372, 373, 408, 409, 410, 713, 714, 761, 762, 798, 845, 846, 954, 955, 956, 957, 958, 959, 960, 961, 962, 1004, 1046, 1157, 1158, 1159, 1219, 1238                                       |
| 1892 | 411, 432, 629, 630, 644, 692, 963, 964, 965, 1160, 1161, 1162, 1220, 1239  |
| 1893 | 412, 585, 692, 703, 966, 967, 968, 969, 1162, 1163, 1164   |
| 1894 | 113, 432, 645, 654, 715, 741, 1008, 1030, 1163, 1165   |
| 1895 | 586, 587, 588, 589, 704, 743, 971, 972, 1031, 1032, 1166, 1167   |
| 1896 | 374, 376, 430, 705, 706, 716, 847, 848, 973, 1031, 1090, 1118, 1168  |
| 1897 | 114, 247, 375, 376, 590, 591, 742, 1009, 1031, 1162, 1169  |
| 1898 | 58, 59, 219, 320, 377, 590, 591, 620, 621, 622, 623, 849, 1031, 1119, 1170   |
| 1899 | 127, 278, 321, 346, 347, 348, 378, 379, 380, 381, 382, 624, 707, 710, 744, 901, 1031, 1120, 1171, 1172, 1173, 1174, 1175   |
| 1900 | 60, 115, 143, 195, 220, 321, 322, 323, 364, 382, 383, 571, 572, 646, 695, 717, 745, 846, 898, 1022, 1023, 1031, 1121, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182                                   |
| 1901 | 61, 62, 324, 325, 326, 327, 328, 329, 384, 385, 394, 395, 433, 449, 450, 592, 607, 608, 615, 625, 696, 698, 746, 918, 922, 974, 1014, 1024, 1025, 1031, 1073, 1081, 1114, 1115, 1183, 1184, 1185, 1186 |
| 1902 | 63, 189, 330, 331, 332, 333, 349, 384, 434, 604, 626, 697, 780, 916, 994, 1026, 1027, 1031, 1047, 1082, 1083, 1084, 1085, 1146, 1175, 1187   |
| 1903 | 334, 335, 336, 384, 386, 387, 421, 435, 696, 850, 851, 917, 918, 1000, 1012, 1014, 1015, 1048, 1051, 1052, 1147, 1148, 1149, 1188, 1189  |
| 1904 | 131, 151, 152, 384, 455, 479, 695, 696, 809, 1013, 1053, 1121, 1150  |
| 1905 | 64, 153, 154, 155, 156, 157, 162, 163, 215, 385, 388, 553, 590, 747, 748, 810, 852, 1016, 1028, 1054, 1071, 1097, 1151, 1152, 1190, 1191, 1193, 1235   |
| 1906 | 158, 456, 457, 593, 919, 1036, 1039, 1075, 1122, 1153, 1192, 1193, 1194, 1223  |
| 1907 | 230, 593, 902, 1037, 1165, 1198  |
| 1908 | 110, 285, 301, 305, 337, 389, 443, 458, 459, 533, 534, 535, 536, 593, 779, 784, 821, 993, 1055, 1196, 1197, 1199, 1200, 1240   |
| 1909 | 124, 255, 286, 413, 414, 442, 460, 532, 537, 538, 539, 540, 541, 594, 749, 824, 923, 1201, 1202, 1241  |
| 1910 | 415, 416, 554, 594, 631, 813, 903, 1033, 1038, 1059  |
| 1911 | 134, 135, 279, 417, 444, 461, 462, 463, 464, 465, 466, 555, 578, 594, 616, 750, 751, 825, 1057, 1060, 1091   |
| 1912 | 121, 170, 171, 221, 231, 287, 338, 467, 500, 542, 543, 544, 594, 764, 994, 995, 1056, 1058   |
| 1913 | 128, 172, 232, 256, 257, 310, 339, 545, 594, 606, 980, 1029, 1061, 1062, 1072, 1123  |



|      | Citation no.  |      | Citation no.  |
|------|---|------|---|
| 1914 | 122,<br>173, 233, 258, 296, 501, 502, 503, 594, 627, 699,<br>904, 978, 1050, 1063, 1064, 1065, 1066, 1092, 1093,<br>1094, 1203, 1204, 1205, 1211.   | 1922 | 89,<br>90, 91, 182, 183, 190, 192, 243, 252, 288, 316, 428,<br>475, 518, 560, 594, 610, 658, 811, 828, 906, 982,<br>1067, 1143, 1229, 1231, 1254, 1255. |
| 1915 | 65,<br>66, 67, 68, 69, 70, 174, 222, 234, 259, 260, 261,<br>262, 299, 303, 311, 504, 546, 556, 557, 594, 617,<br>632, 815, 816, 1030, 1154, 1206, 1207, 1208, 1212.   | 1923 | 92,<br>93, 94, 95, 96, 166, 184, 193, 239, 244, 275, 289,<br>445, 561, 673, 726, 727, 736, 777, 778, 887, 888,<br>889, 1143, 1230.                      |
| 1916 | 71,<br>72, 73, 74, 75, 76, 138, 175, 235, 263, 264, 265,<br>266, 267, 284, 299, 300, 340, 436, 437, 468, 469,<br>477, 505, 506, 558, 582, 594, 628, 700, 719, 720,<br>730, 731, 735, 738, 739, 817, 818, 819, 820, 832,<br>869, 981, 986, 1042, 1074, 1098, 1099, 1109, 1209,<br>1210.                              | 1924 | 97,<br>164, 210, 245, 246, 290, 317, 318, 418, 519, 528,<br>595, 596, 659, 674, 803, 804, 890, 907, 1018, 1068,<br>1069, 1070.                          |
| 1917 | 77,<br>136, 176, 177, 178, 208, 223, 236, 268, 269, 438,<br>470, 480, 507, 508, 547, 558, 594, 712, 721, 722,<br>752, 753, 754, 797, 802, 877, 909, 1011, 1041, 1094,<br>1140, 1232.  | 1925 | 98,<br>99, 100, 101, 102, 213, 276, 342, 520, 529, 562, 594,<br>636, 660, 728, 793, 1213, 1214.   |
| 1918 | 78,<br>159, 160, 209, 248, 249, 250, 431, 471, 549, 573,<br>594, 613, 633, 634, 701, 723, 728, 807, 808, 870,<br>878, 879, 910, 990, 1017, 1094.  | 1926 | 103,<br>165, 180, 185, 246, 253, 312, 350, 520, 521, 563,<br>594, 661, 662, 675, 975, 984, 999, 1096, 1215, 1234.                                       |
| 1919 | 79,<br>225, 226, 227, 237, 251, 270, 271, 272, 390, 425,<br>426, 445, 472, 509, 510, 527, 548, 574, 594, 678,<br>702, 708, 724, 758, 770, 772, 853, 880, 978, 986,<br>1094, 1103, 1104, 1236.   | 1927 | 246, 254,<br>276, 291, 446, 451, 493, 579, 668, 693, 913, 988.  |
| 1920 | 80,<br>81, 82, 83, 84, 85, 86, 87, 109, 112, 133, 187, 238,<br>273, 274, 315, 427, 445, 483, 511, 512, 575, 594,<br>598, 599, 600, 601, 605, 635, 651, 656, 657, 657a,<br>709, 734, 806, 822, 827, 829, 853, 881, 882, 883,<br>884, 905, 911, 924, 979, 983, 991, 998, 1094, 1095,<br>1105, 1112, 1124, 1141, 1253. | 1928 | 104, 179, 180, 246, 254,<br>343, 344, 391, 566, 609, 639, 767, 874, 894, 980.   |
| 1921 | 88,<br>149, 150, 190, 191, 224, 304, 319, 341, 473, 474,<br>513, 514, 515, 516, 517, 594, 602, 725, 733, 755,<br>771, 798, 799, 885, 886, 912, 926, 927, 996, 1040,<br>1106, 1113, 1125, 1228.  | 1929 | 105,<br>106, 118, 119, 120, 146, 212, 218, 228, 229, 254,<br>292, 293, 522, 565, 637, 638, 663, 664, 667, 676,<br>729, 756, 757, 872, 908, 989.         |
|      |   | 1930 | 107, 126, 168,<br>180, 214, 523, 611, 757, 769, 873, 874, 892, 1142.  |
|      |   | 1931 | 282,<br>313, 345, 392, 524, 525, 566, 580, 665, 757, 823,<br>875, 876, 893, 997.  |
|      |   | 1932 | 108,<br>180, 294, 295, 393, 757, 768, 894, 1034, 1140.  |
|      |   | 1933 | 148<br>186, 420, 429, 526, 581, 666, 797, 976, 1035, 1079   |







